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TITLE: LASER ABLATION OF WAVEGUIDE STRUCTURES

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AMENDED SPECIFICATION PARAGRAPHS

Starting at line 37, please replace the last paragraph on page 1, with the following amended paragraph:

The present invention provides a method of processing an optical device incorporating a waveguide with a core, the method comprising ~~the step of utilizing a laser to heat and thereby ablate a surface of the device so as to induce a stress in said optical device and thereby alter an optical characteristic of the waveguide, wherein the power density of the laser is selected to effect surface ablation~~ : selecting an optical characteristic of the core of the waveguide and a desired value or property of the selected optical characteristic; ablating a surface of the optical device by means of a laser without ablating the core of the waveguide, the power density of the laser being selected to effect surface ablation of the optical device; and controlling the ablating of the surface so that the selected optical characteristic is modified so as to assume the desired value or property.

Starting at line 10, please replace the fourth paragraph on page 3 with the following amended paragraph:

The invention may alternatively be defined as providing an optical device incorporating a waveguide with a core, wherein the optical device has been processed ~~utilizing a laser to heat and thereby ablate a surface of the device so as to induce a stress in said device and thereby alter an optical characteristic of the waveguide, wherein the power density of the laser is selected to effect surface ablation~~ by a method comprising: selecting an optical characteristic of the core of the waveguide and a desired value or property of the selected optical characteristic; ablating a surface of the optical device by means of a laser without ablating the core of the waveguide, the power density of the laser being selected to effect surface ablation of the optical device; and controlling the ablating of the surface so that the selected optical characteristic is modified so as to assume the desired value or property.

Please replace the last paragraph on page 5 starting at line 33 with the following amended paragraph:

In initial experiments, the longer arm of a MZ device (12 m SiO_2 cladding and buffer layers, 4x5 m GeO_2-doped core n – 0.01) was processed for testing and confirmation of the concept. Measurements were taken at intervals after briefly halting the exposure at fixed times since the fibre coupling was increasingly affected by longer exposures. It was noted that both TE and TM shifted to longer wavelengths indicating an increase in refractive index. The TE effective index eventually increased more rapidly such that the splitting was reduced as shown in Fig. 4 which shows the change in wavelength splitting between TE and TM eighenstate with exposure to unfocussed light. Initially, however, as shown in Fig. 3, an increase in the splitting ~~observed. We believe~~ is

observed, which is believed to be related to an initial increase in compressive stress and subsequent compaction of the core glass. The magnitude of reduction is sufficient to allow compensation of birefringence in most planar silica-on-silicon devices where the splitt ng is much lower than the device chosen here. Further, this value is unsaturated.